National Aeronautics and
Space Administration

Environment

Activated Metal Treatment System (AMTS) for Paints

A safe and effective method for removing polychlorinated biphenyls

The National Aeronautics and Space Administration (NASA) seeks partners interested in the commercial application of the Activated Metal Treatment System (AMTS) for treating polychlorinated biphenyls (PCBs) in paints. NASAs Kennedy Space Center is offering companies licensing or partnering opportunities in the development of this innovative remediation technology.

Current physical removal methods are able to strip off PCB containing paint from surfaces (e.g., media blasting); however, these methods typically create a new waste stream that must be treated according to Toxic Substances Control Act (TSCA)regulation. In contrast, AMTS extracts PCBs and breaks them down into benign by-products while on the structure. Therefore, no additional treatment for PCBs is required. Also, because the treated surface can be reused following application, AMTS has advantages over other methods and often opens up recycling opportunities that would not have been possible prior to AMTS application.

BENEFITS

- No impact to structure - does not affect the material beneath the paint.
- In situ - treats PCBs in place versus traditional abatement methods.
- Cost-competitive - requires none of the costs associated with placing a building under vacuum or transporting, treating, and/or disposing of a secondary waste stream.
- Effective - has been shown in lab-scale and field-scale tests to remove approximately 80% of PCBs from paint within 4 hours, and approximately 100% of PCBs within 48 hours.
- Safe - produces benign byproducts
- Versatile - an be used as a paint-on/wipe-off method for in-situ applications or as an immersion method (e.g., for dismantled parts awaiting disposal).

technology solution

THE TECHNOLOGY

PCBs have been shown to cause cancer in animals and to have other adverse effects on immune, reproductive, nervous, and endocrine systems. Although the production of PCBs in the United States has been banned since the late 1970s, many surfaces are still coated with PCB-laden paints. The presence of PCBs in paints adds complexity and expense for disposal. Some treatment methods (e.g., use of solvents, physical removal via scraping) are capable of removing PCBs from surfaces, but these technologies create a new waste stream that must be treated. Other methods, like incineration, can destroy the PCBs but destroy the painted structure as well, preventing reuse.

To address limitations with traditional abatement methods for PCBs in paints, researchers at NASAs Kennedy Space Center (KSC) and the University of Central Florida have developed the Activated Metal Treatment System (AMTS) for Paints. This innovative technology consists of a solvent solution (e.g., ethanol, d-limonene) that contains an activated zero-valent metal.

AMTS is first applied to the painted surface either using spray-on techniques or wipe-on techniques. The solution then extracts the PCBs from the paint. The extracted PCBs react with the microscale activated metal and are degraded into benign by-products. This technology can be applied without removing the paint or dismantling the painted structure. In addition, the surface can be reused following treatment.

AMTS paste being applied to an I-beam contaminated with PCB paint

Cold weather testing of AMTS at Badger Army Ammunition Plant

APPLICATIONS

The technology has several potential applications:

- Painted structures, such as buildings and ships
- Concrete surfaces contaminated by PCB-laden transformer oil
- Caulks and other adhesives
- Electrical equipment
- Soils (ex situ)
- Other PCB-contaminated debris

PUBLICATIONS

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Patent Pending

More Information

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